



TD74-NTF-001

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ORGANIZATIONAL ISSUANCE

TD74

Nozzle Test Facility Operating Procedure

Revision E

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
AS-IS	BASELINE	Oct/15/97	Baseline AS IS, combines the following documents: NTE-TA-001 Rev1, NTE-SA-001Rev1,NTE-FP-001 Rev1, Model Test Procedure, Service Air Systems Operation, and Facility Electrical Power Operations
AS-IS	A	7/19/99	Due to the reorg this Baseline supersedes the document OWI-ED34-NTF-001 by the same title.
DRAFT	B	Never Released	Revising Document to reflect the new organization and the OWI format.
DRAFT	C	Never Released	Revised document. Added the following documents: Hydraulic Systems Operation- NTE-HY-001,Regenerative Heat System Operation- NTE-RH-001,Model/Facility Pre-Heat Operation- NTE-MH-001.
Revision	D	9/12/2000	Added personnel training and certification instructions.
Revision	E	11/2/2004	Updated due to CAITS 04-DA01-0387. Updated title.

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Nozzle Test Facility Operating Procedure

1.0 PURPOSE

This **facility operating procedure** contains instructions for model/facility test operations at the Nozzle Test Facility (NTF).

2.2.0 APPLICABILITY

This facility operating procedure applies to the Test and Evaluation Department personnel and its contractors involved in Operations at the NTF.

3.0 APPLICABLE DOCUMENTS

TD70-001 Test and Evaluation Department

TD74-100 Experimental Fluid Dynamics Group

TD74-NTF-002 Nozzle Test Facility Pre-Heat System Operating Procedure

TD74-NTF-003 Nozzle Test Facility Regenerative Heat System Operating Procedure

NPR 1441.1 NASA Records Retention Schedules

MPR 1050.1 Contract (Customer Agreement) Review

MPR 8715.1 Marshall Safety, Health and Environmental (SHE) Program

MWI 4000.1 Control of Customer Supplied Product

4.0 DEFINITIONS

- 4.1 Affected Personnel: All Experimental Fluid Dynamic Group Personnel.
- 4.2 Calibration Contact: The person responsible for one or more pieces of calibration equipment. Responsibilities include tracking the usage of the equipment and scheduling calibration of the equipment with the calibration facility, in-house, or outside vendor.
- 4.3 Calibration Coordinator: The person who coordinates the activities of the calibration contacts and is the custodian of the inventory of calibrated equipment.
- 4.4 CDDE: Center Director's Discretionary Fund
- 4.5 Customer Agreement: Agreement for MSFC to supply products or services to an external customer. Refer to MPR 1050.1 for details.

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- 4.6 Customer Supplied Product: Products supplied by a customer for the purpose of fabrication, testing, storage, analysis and/or refurbishment. Refer to MWI 4000.1 for details.
- 4.7 CWI: Centerwide Work Instruction
- 4.8 Data: Electronic or written information (obtained during test programs) stored in any of several media (magnetic tapes, computer files, photographs, reports, etc.).
- 4.9 Data Acquisition Engineer: Individual responsible for a facility data acquisition system including transducers, data acquisition hardware and software, and on-site displays, printers, and data storage medium.
- 4.10 Data Manager: Custodian of controlled electronic data.
- 4.11 Facility: A group of mechanical, electrical, and control subsystems designed to prepare for, conduct, and acquire data for a test run of a test article.
- 4.12 Facility Engineer: Lead and point-of-contact for a specified facility who is responsible for the operation, maintenance, and development of that facility.
- 4.13 Facility Operator: Person authorized by the TD74 Group Leader to operate a specified facility.
- 4.14 IDP: Individual Development Plan.
- 4.15 MPR: Marshall Procedural Requirements.
- 4.16 NTE: Nozzle Test Facility
- 4.17 Records Custodian: Individual who is responsible for controlling, storing, retrieving, and disposing of records.
- 4.18 Task Agreement (TA): For the purposes of the organizational issuance, a TA is the directive for an affected person to perform a body of work. This directive is the approval from management to perform the work and can be in various forms (memoranda, e-mail, verbal) and is evidenced by Group or Department Lead's certification of time card.
- 4.19 Test Engineer: Person or persons responsible for the planning, data collection, and reporting for a specified test.
- 4.20 Waiver: A written authorization to depart from specified requirements in a controlled document.

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5.0 INSTRUCTIONS CONTENT

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5.1 NTE-FP-001 FACILITY ELECTRICAL POWER OPERATIONS CONTENTS

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5.1.1 PURPOSE

This procedure contains instructions for aligning the turbine building electrical facilities.

5.1.2 STARTUP

5.1.2.1 PREREQUISITES

Facility substation is operating and is aligned by the Army.

5.1.2.2 PROCEDURE

The Facility Operator shall –

PERFORM facility electrical breaker alignment per Table A of this procedure.

5.1.3 SHUTDOWN

5.1.3.1 PREREQUISITES

Power is not required to NTF components.

5.1.3.2 PROCEDURE

The Facility Operator shall –

PERFORM facility electrical breaker alignment per Table B of this procedure.

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TABLE A

START-UP

ELECTRICAL LINEUP

PANEL PDP1 (West wall of 4777B)

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
	MAIN	ON	
02	Regenerative Heater (HCU 123)	ON	
03	Hydraulic Unit (HPU 700)	ON	
04	Pre-heat Heater (HCU 125)	ON	
05	CONTROL ROOM ISOLATION TRANSFORMER	ON	
09	TTE CRANE (4777-B)	ON	
10	PANEL AC-1 (4777-A)	ON	
12	PANEL C	ON	
13	Crane (4777- A)	ON	
14	Blower (MC122)	ON	
21	AREA ALARM SYSTEM--PANEL LPA(4777-A)	ON	

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Table A (con.'t) START-UP

ELECTRICAL LINEUP

PANEL C (South wall of 4777B)

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
	MAIN	ON	
03	CONTROL ROOM LIGHTS	ON	
05	CONTROL ROOM RECEPTACLES	ON	
08	CONTROL ROOM RECEPTACLES	ON	
10	CONTROL ROOM AIR CONDITIONER	ON	
12	CONTROL ROOM AIR CONDITIONER	ON	
13	Oxygen monitor system	ON	
19	TTE OUTSIDE LIGHTS	ON	
21	TTE OUTSIDE LIGHTS	ON	
23	TTE OUTSIDE LIGHTS	ON	
24	TU PANEL (4777-A)	OFF	
31	PANEL LPA (4777-A)	ON	
	TTE CRANE DISCONNECT (EAST WALL TTE)	ON	

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Table A (con.'t) START-UP

ELECTRICAL LINEUP

PANEL PDP2 (4777B control room)

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
	MAIN	ON	
01	CONTROL ROOM PANEL G	ON	
02	CONTROL ROOM PANEL B	ON	
03	CONTROL ROOM PANEL C	ON	
04	CONTROL ROOM PANEL D	ON	
05	CONTROL ROOM PANEL E	ON	
06	CONTROL ROOM PANEL F	ON	
07	CONTROL ROOM PANEL A	ON	
08	CONTROL ROOM PANEL H	ON	
09	CONTROL ROOM PANEL I	ON	
10	CONTROL ROOM PRINTER STAND	ON	
12	CONTROL ROOM UPS POWER SUP	ON	

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TABLE B

SHUTDOWN

ELECTRICAL LINEUP

PANEL PDP1 (West wall of 4777B)

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
	MAIN	ON	
02	Regenerative Heater (HCU 123)	OFF	
03	Hydraulic Unit (HPU 700)	OFF	
04	Pre-heat Heater (HCU 125)	OFF	
05	CONTROL ROOM ISOLATION TRANSFORMER	ON	
09	TTE CRANE (4777-B)	OFF	
10	PANEL AC-1 (4777-A)	OFF	
12	PANEL C	ON	
13	Crane (4777- A)	OFF	
14	Blower (MC122)	OFF	
21	AREA ALARM SYSTEM--PANEL LPA(4777-A)	ON	

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Table B (con.'t) SHUTDOWN

ELECTRICAL LINEUP

PANEL C (South wall of 4777B)

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
	MAIN	ON	
03	CONTROL ROOM LIGHTS	ON	
05	CONTROL ROOM RECEPTACLES	ON	
08	CONTROL ROOM RECEPTACLES	ON	
10	CONTROL ROOM AIR CONDITIONER	ON	
12	CONTROL ROOM AIR CONDITIONER	ON	
13	Oxygen moniter system	ON	
19	TTE OUTSIDE LIGHTS	ON	
21	TTE OUTSIDE LIGHTS	ON	
23	TTE OUTSIDE LIGHTS	ON	
24	TU PANEL (4777-A)	OFF	
31	PANEL LPA (4777-A)	ON	
	TTE CRANE DISCONNECT (EAST WALL TTE)	ON	

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Table B (con.'t) SHUTDOWN

ELECTRICAL LINEUP

PANEL PDP2 (4777B control room)

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
	MAIN	ON	
01	CONTROL ROOM PANEL G	OFF	
02	CONTROL ROOM PANEL B	OFF	
03	CONTROL ROOM PANEL C	OFF	
04	CONTROL ROOM PANEL D	OFF	
05	CONTROL ROOM PANEL E	OFF	
06	CONTROL ROOM PANEL F	OFF	
07	CONTROL ROOM PANEL A	ON	
09	CONTROL ROOM PANEL I	OFF	
10	CONTROL ROOM PRINTER STAND	OFF	
12	CONTROL ROOM UPS POWER SUP	ON	

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5.2 NTE-HY-001 HYDRAULIC SYSTEM OPERATION

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5.2.1 PURPOSE

This procedure contains instructions for startup and shutdown of the hydraulic oil system including the hydraulic power unit.

5.2.2 STARTUP

5.2.2.1 PREREQUISITES

5.1.1 Valves and electrical breakers aligned in accordance with Table C.

.1.2 Verify Hydraulic Oil Storage Tank level, located at the north wall of the TTE high bay, is greater than 75% as indicated in the HPU oil reservoir sight glass.

.1.3 Verify the blue OIL LEVEL/TEMP light on JB11, located on the north wall of the TTE high bay, is on.

5.2.2.2 PROCEDURE

The Facility Operator shall –

START HPU-700, Hydraulic Power Unit, by pressing the start push-button on JB11.

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5.2.3 SHUTDOWN

5.2.3.1 PREREQUISITES

The hydraulic system is no longer required to be in operation.

5.2.3.2 PROCEDURE

The Facility Operator shall –

- 5.2.3.2.1 STOP HPU-700, Hydraulic Power Unit, by pressing the stop push-button on JB11 located on the north wall of the TTE high bay.
- 5.2.3.2.2 Slowly OPEN V-205, PCV-115 Oil Supply Equalization Valve, located on Hydraulic Rack #1 at the east wall of the TTE high bay area, until PG-213 on Hydraulic Rack #1 indicates no pressure.
- 5.2.3.2.3 Align valves and electrical breakers in accordance with Table D.

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Table C START-UP

VALVE LINEUP

VALVE NUMBER	VALVE NAME	POSITION REQUIRED
V-212	HPU-700 DISCHARGE VALVE	OPEN
BBV-216	PRESSURE SWITCH ISOLATION	OPEN
BBV-409	PRESSURE SWITCH ISOLATION	OPEN
V-200	PCV-115 OIL SUPPLY ISOLATION	OPEN
BBV-206	PG-213 ISOLATION	OPEN
V-202	OIL SUPPLY TO PCV-115	OPEN
V-204	OIL RETURN FROM PCV-115	OPEN
V-205	PCV-115 OIL SUPPLY EQUALIZATION VALVE	CLOSED
V-207	PCV-115 ACCUMULATOR -208 ISOLATION	OPEN
V-223	PCV-110 ACCUMULATOR ACC-224 ISOLATION	OPEN
V-222	PCV-110 OIL SUPPLY ISOLATION	OPEN
BBV-215	PG-217 ISOLATION	OPEN
V-218	OIL SUPPLY TO PCV-110	OPEN
V-220	OIL RETURN FROM PCV-110	OPEN
V-221	PCV-110 OIL SUPPLY EQUALIZATION VALVE	CLOSED
V-228	TCV-107B ACCUMULATOR ACC-238 ISOLATION	OPEN
V-229	TCV-107B OIL SUP ISOLATION	OPEN
BBV-230	PG-232 ISOLATION	OPEN
V-233	OIL SUPPLY TO TCV-107B	OPEN
V-235	OIL RETURN FROM TCV-107B	OPEN
V-236	TCV-107B OIL SUPPLY EQUALIZATION VALVE	CLOSED
V-242	TCV-107B ACCUMULATOR ACC-252 ISOLATION	OPEN
V-243	TCV-107A OIL SUP ISOLATION	OPEN
BBV-249	PG-251 ISOLATION	OPEN
V-245	OIL SUPPLY TO TCV-107A	OPEN
V-247	OIL RETURN TO TCV-107A	OPEN
V-244	TCV-107A OIL SUPPLY EQUALIZATION VALVE	CLOSED

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Table C (con.'t) START-UP

ELECTRICAL LINEUP

PANEL PDP1

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
03	HPU-700 POWER SUPPLY	ON	
JB11 DISCONNECT	HPU-700 DISCONNECT(NORTH WALL TEE)	ON	

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Table D SHUTDOWN

VALVE LINEUP

VALVE NUMBER	VALVE NAME	POSITION REQUIRED
V-212	HPU-700 DISCHARGE VALVE	CLOSED
V-200	PCV-115 OIL SUPPLY ISOLATION	CLOSED
V-202	OIL SUPPLY TO PCV-115	CLOSED
V-204	OIL RETURN FROM PCV-115	CLOSED
V-205	PCV-115 OIL SUPPLY EQUALIZATION VALVE	CLOSED
V-207	PCV-115 ACCUMULATOR -208 ISOLATION	CLOSED
V-223	PCV-110 ACCUMULATOR ACC-224 ISOLATION	CLOSED
V-222	PCV-110 OIL SUPPLY ISOLATION	CLOSED
V-218	OIL SUPPLY TO PCV-110	CLOSED
V-220	OIL RETURN FROM PCV-110	CLOSED
V-221	PCV-110 OIL SUPPLY EQUALIZATION VALVE	CLOSED
V-228	TCV-107B ACCUMULATOR ACC-238 ISOLATION	CLOSED
V-229	TCV-107B OIL SUP ISOLATION	CLOSED
V-233	OIL SUPPLY TO TCV-107B	CLOSED
V-235	OIL RETURN FROM TCV-107B	CLOSED
V-236	TCV-107B OIL SUPPLY EQUALIZATION VALVE	CLOSED
V-242	TCV-107B ACCUMULATOR ACC-252 ISOLATION	CLOSED
V-243	TCV-107A OIL SUP ISOLATION	CLOSED
V-245	OIL SUPPLY TO TCV-107A	CLOSED
V-247	OIL RETURN TO TCV-107A	CLOSED
V-244	TCV-107A OIL SUPPLY EQUALIZATION VALVE	CLOSED

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Table D (con.'t) SHUTDOWN

ELECTRICAL LINEUP

PANEL PDP1

BREAKER NUMBER	BREAKER NAME	POSITION REQUIRED	INITIALS
03	HPU-700 POWER SUPPLY	OFF	
JB11	HPU-700 DISCONNECT DISCONNECT (NORTH WALL TEE)	OFF	

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5.3 NTE-SA-001 SERVICE AIR SYSTEMS OPERATION

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5.3.1 PURPOSE

This procedure contains instructions for start-up and shutdown of the facility air and service air systems.

5.3.2 START-UP

5.3.2.1 PREREQUISITES

- 5.3.2.1.1 T-100 and/or T-101, Test Air Storage Tanks, are available for receiving air.
- 5.3.2.1.2 Service Air system aligned per Table E.
- 5.3.2.1.3 Missile grade air pressure is greater than 1800 psi as indicated on PG-105 on T-100 air regulator panel.

5.3.2.2 PROCEDURE

The Facility Operator shall –

- 5.3.2.2.1 If necessary, OPEN V-408, T-100 Air Supply Isolation Valve, located under T-100, to charge the tank.
- 5.3.2.2.2 If necessary, OPEN V-407, Service Air Isolation Valve, on T-100 air regulator panel.
- 5.3.2.2.3 If necessary, ADJUST V-405, PRV-151 Pressure Adjusting Regulator, to obtain 400 psi as indicated on PG-107, Test Air Storage Tanks Pressure located on T-100 air regulator panel.
- 5.3.2.2.4 If necessary, ADJUST V-302, PRV-300 Pressure Adjusting Regulator, to obtain approximately 80 psi as indicated on PG-305 located on the Service Air Panel.
- 5.3.2.2.5 If necessary, ADJUST PRV-350, Regenerative Heater Purge Air Regulator, to obtain 1 - 3 S.C.F.H as indicated on FM-934 located on the Regenerative Heater.
- 5.3.2.2.6 If necessary, OPEN AV3/4744, located on Air Regulator Panel at T-200.
- 5.3.2.2.7 If necessary, ADJUST HOR1/4744, located on Air Regulator Panel at T-200, to obtain approximately 1000 psig on PG AP2/4744.
- 5.3.2.2.8 If necessary, OPEN AV7/4744, located on Air Regulator Panel at T-200.

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- 5.3.2.2.9 If necessary, OPEN AV8/4744, located on Air Regulator Panel at T-200.
- 5.3.2.2.10 If necessary, ADJUST HOR3/4744, located on Air Regulator Panel at T-200, to obtain approximately 400 psig.
- 5.3.2.2.11 If necessary, OPEN AV4/4744, located on Air Regulator Panel at T-200.
- 5.3.2.2.12 If necessary, OPEN AV5/4744, located on Air Regulator Panel at T-200.
- 5.3.2.2.13 If necessary, ADJUST HOR2/4744, located on Air Regulator Panel at T-200, to obtain approximately 150 psig on PG AP3/4474.
- 5.3.2.2.14 If necessary, OPEN AV45/4744, located on Air Regulator Panel at T-200.
- 5.3.2.2.15 If necessary, OPEN HOV-150, located on the VPV ejector control valve panel, verify pressure gage reads 150 psig.
- 5.3.2.2.16 If necessary, ADJUST HOR-125 to obtain 115 psig on the pressure gage.
- 5.3.2.2.17 If necessary, OPEN HOV-75 located on the VPV ejector control valve panel.
- 5.3.2.2.18 CLOSE Safety Valve Airline Vent – AFD.
- 5.3.2.2.19 Regulate AFD Safety Valve – Downstream Regulator Pressure to 80 psig.

5.3.3 SHUTDOWN

5.3.3.1 PREREQUISITES

Service Air and missile grade air are no longer required to support testing.

5.3.3.2 PROCEDURE

NOTE

If tank T-100 is needed by the Air Flow facility for blowdowns, N/A step 5.3.4.2.1.

- 5.3.3.2.1 CLOSE V-400, T-100 Air Regulator Panel Missile Grade Isolation located at the missile grade air charging panel, is open.
- 5.3.3.2.2 PERFORM Service Air system alignment per Table F.

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Table E START-UP

VALVE LINEUP

VALVE NUMBER	VALVE NAME	POSITION REQUIRED
V-407	SERVICE AIR PANEL ISOLATION	CLOSED (NOTE 1)
V-408	T-100 AIR ISOLATION	CLOSED (NOTE 1)
AV1/4744	AIR REGULATOR PANEL ISOLATION VALVE	CLOSED (NOTE 1)
AV2/4744	AIR REGULATOR PANEL ISOLATION VALVE FOR AP1	CLOSED (NOTE 1)
V-400	MISSILE GRADE TO SERVICE AIR ISOLATION	OPEN
V-401	PG-105 ISOLATION	OPEN
V-402	PG-106 ISOLATION	OPEN
V-403	PG-107 ISOLATION	OPEN
V-406	T-100 BLOWDOWN TO ATMOSPHERE	CLOSED
V-301	SENSING LINE PRESSURE ISOLATION	OPEN
BBV-304	PG-305 ISOLATION	OPEN
BBV-307	PS-150 ISOLATION	OPEN
V-317	ROV-118 ACTUATING AIR ISOLATION	OPEN
V-318	ROV-119 ACTUATING AIR ISOLATION	OPEN
V-313	ROV-126 ACTUATING AIR ISOLATION	OPEN
V-314	ROV-124 ACTUATING AIR ISOLATION	OPEN
V-323	VCV-528 ACTUATING AIR ISOLATION	OPEN
V-321	ROV-101 A & B ACTUATING AIR ISOLATION	OPEN
V-310	ROV-127 ACTUATING AIR ISOLATION	OPEN
V-602	REGENERATIVE HEATER PURGE AIR VENT	OPEN

NOTE 1: If these valves are open for the air flow facility to use tank T-100, N/A these valves.

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Table F SHUTDOWN

VALVE LINEUP

VALVE NUMBER	VALVE NAME	POSITION REQUIRED
V-407	SERVICE AIR PANEL ISOLATION	CLOSED (NOTE 1)
V-408	T-100 AIR ISOLATION	CLOSED (NOTE 1)
AV1/4744	AIR REGULATOR PANEL ISOLATION VALVE	CLOSED (NOTE 1)
AV2/4744	AIR REGULATOR PANEL ISOLATION VALVE FOR AP1	CLOSED (NOTE 1)
V-406	T-100 BLOWDOWN TO ATMOSPHERE	CLOSED
V-317	ROV-118 ACTUATING AIR ISOLATION	CLOSED
V-318	ROV-119 ACTUATING AIR ISOLATION	CLOSED
V-313	ROV-126 ACTUATING AIR ISOLATION	CLOSED
V-314	ROV-124 ACTUATING AIR ISOLATION	CLOSED
V-323	VCV-528 ACTUATING AIR ISOLATION	CLOSED
V-321	ROV-101 A & B ACTUATING AIR ISOLATION	CLOSED
V-310	ROV-127 ACTUATING AIR ISOLATION	CLOSED
V-325	MODEL SERVICE AIR MANIFOLD ISOLATION	CLOSED

NOTE 1: If these valves are open for the air flow facility to use tank T-100, N/A these valves.

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5.4 NTE-TA-001 MODEL TEST PROCEDURES

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5.4.1 PURPOSE

This procedure contains instructions for operating the NTF system to provide a pressurized gaseous media for performance testing of scale model advanced nozzle concepts. Testing may follow model change out or facility modification/repair.

5.4.2 START-UP

5.4.2.1 PREREQUISITES

The Facility Operator shall –

5.4.2.1.1 Verify the following are operational:

5.4.2.1.1.1 Facility/Model amberline setpoints.

5.4.2.1.1.2 Facility/Model redline setpoints.

5.4.2.1.1.3 Facility/Model interlocks.

5.4.2.1.2 Start baritron transducers 4 hours before test per Table A.

5.4.2.1.3 Align the facility electrical system per Section 5.1 of this procedure.

5.4.2.1.4 Have the hydraulic system 5.4.2.1.6 Prior to operating Ejector 1 or 2, or the core flow, verify the test cabin is free of tools and loose debris. Verify a minimum of eight, equally spaced stubs/nuts are installed and tightened joining the cabin halves. Verify the Ejector #1 piping flange is bolted to the diffuser inlet flange at the west end of the test cabin.

5.4.2.1.7 Perform the preheating of the model/facility per TD74-NTF-002. Perform the thermal matrix heater regeneration per TD74-NTF-003. Both of these will be used as needed to prepare the NTF for test operations.

5.4.2.1.8 Verify that the pyrotechnic device located in the TTE exhaust piping on the south side of the plenum has been removed for the test series per a test preparation sheet (TPS).

5.4.2.1.9 Verify Test Systems Master Control Disable/Enable switch on Panel C in control room 4777B is in the “Disable” position.

5.4.2.1.10 Verify electrical jumpers and annunciator light bulb check on Panel G per Table B of this procedure.

5.4.2.1.11 Verify T-100 and/or T-101, Test Air Storage Tanks, are adequately charged as indicated on the AIR-PSIG/TEMP readout in Panel D.

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- 5.4.2.1.12 Verify Single Leg Air Flow air storage tanks or tank farm are adequately charged as indicated on the AIR-PSIG/TEMP readout in Panel D.

NOTE

For operation of the Test Air Storage Tank Charging System, refer to Table C of this procedure.

- 5.4.2.1.13 Ensure the model data acquisition systems are aligned and calibrated by the Test Engineer.

5.4.2.2 PROCEDURE

The Facility Operator shall –

- 5.4.2.2.1 Align valves as follows:

Valve	Description	Position
ROV-101A/B	CORE SUPPLY ISO	CLOSED *
TCV-107A	HOT LEG CONTROL VALVE	OPEN *
TCV-107B	COLD LEG CONTROL VALVE	CLOSED *
PCV-110	PRESSURE CONTROL VAVLE	CLOSED *
PCV-115	BACKPRESSURE CONT. VALVE	CLOSED *
ROV-511	E1 ISOLATION VALVE	CLOSED
ROV-512	E2 ISOLATION VALVE	CLOSED
PCV-532	2"EJECT. CONTROL VAVLE	CLOSED
PCV-522	4"EJECT. CONTROL VALVE	CLOSED
PCV-531	2"EJECT. CONTROL VALVE	CLOSED
PCV-521	4"EJECT. CONTROL VALVE	CLOSED
ROV-132	CORE FLOW ISO.	CLOSED
HOV-101	TANK ISO.	OPEN
HOV-102	TANK ISO.	OPEN
HOV-110	V-109 BYPASS	CLOSED
HOV-109	SAF TANK ISO.	CLOSED
HOV-112	HOV-111 BYPASS	CLOSED
HOV-111	MIXER ISO.	CLOSED
HOV-501	E1 ISO.	OPEN
HOV-502	E2 ISO.	OPEN
HOV-350	TTE EJECT. ISO.	CLOSED
HOV-541	E1 ISO.	OPEN

NOTE

Steps 5.4.2.2.2 thru 5.4.2.2.10 for ejector operations. For core flow only, disregard these steps.

- 5.4.2.2.2 Slowly OPEN HOV-110, V-109 Bypass Valve, until pressure equalizes

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across HOV-109, SAF Tank Isolation Valve.

5.4.2.2.3 When pressure equalizes, OPEN HOV-109, SAF Tank Isolation Valve.

5.4.2.2.4 When HOV-109 is open, CLOSE HOV-110, HOV-109 Bypass Valve.

5.4.2.2.5 Using table in TABLE E, verify pressure gage readings for the following panels:

Panel	Affected Valves	Reading
Solenoid Iso.	ROV-511, ROV-512	150 PSIG
Press. Control Valve	PCV-532,-522,-521,-531	115 PSIG
Safety Downstream Reg.	ROV-132	80 PSIG

5.4.2.2.6 OPEN Ejector 1 & 2 solenoid isolation valve.

5.4.2.2.7 OPEN PCV1 isolation valve.

5.4.2.2.8 OPEN PCV2 isolation valve.

5.4.2.2.9 OPEN PCV3 isolation valve.

5.4.2.2.10 OPEN PCV4 isolation valve.

NOTE

For operation of the TCS controller, which are located in 4777B control room, refer to Table D of this procedure.

5.4.2.2.11 By using "SP", SET TIC-107, TCV-107A/B Temperature Indicating Controller on Panel D, to the desired temperature (To) required for the current test.

5.4.2.2.12 By using "SP", SET PIC-110, PCV-110 Pressure Indicating Controller on Panel D, to a pressure (Po) of 50 psi.

5.4.2.2.13 When the regenerative heater is at the desired temperature and the model/facility has been adequately pre-heated, perform the following:

5.4.2.1.13.1 STOP the regenerative heater per TD74-NTF-003.

5.4.2.2.13.2 STOP preheating of model/facility per TD74-NTF-002.

5.4.2.2.13.2.1 PLACE Heat Systems Control Disable/Enable switch on Panel E in the "Disable" position.

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5.4.2.2.13.2.2 Manually CLOSE TCV-107A (Hot Leg).

- 5.4.2.2.14 PLACE Loop 1 of TIC-107 in automatic by pressing the "A" push-button on the controller.
- 5.4.2.2.15 PLACE Loop 1 of PIC-110 in automatic by pressing the "A" push-button on the controller.
- 5.4.2.2.16 Reset the annunciator panels by turning the Annunciator Acknowledge/Reset switch on panel C to "Acknowledge" first and then to "Reset".
- 5.4.2.2.17 VERIFY all annunciator lights on Annunciator No. 1 Test Systems located on Panel A and Annunciator No. 2 Drive Systems located on Panel G are not illuminated.
- 5.4.2.2.18 Turn on Schlerin system, if required.
- 5.4.2.2.19 Turn on video equipment, if required.

NOTE

At this point Facility Engineer must determine which pressurized blowdown method is to be used. If core flow only is to be used then go to Section 3. If Ejector 1 only is to be used then go to Section 4. If Ejector 2 only is to be used then go to Section 5. If all 3 are to be used at once go to Section 6.

NOTE

Refer to Table E of this procedure for operation of the facility data acquisition computer.

5.4.3 CORE FLOW

- 5.4.3.1 PLACE Pyrotechnic Disable/Enable switch, JB13, located on the south side of the plenum cart in the "Enable" position and remove key.
- 5.4.3.2 Turn on the warning bells (area alarm and warning system) by placing the "BELL" switch on Panel C to "ON" and check parking lot and test areas for other personnel.
- 5.4.3.3 Start recording facility data with the facility data acquisition computer.
- 5.4.3.4 Rotate key to the "ENABLE" position for ROV-132, Ejector and Core Flow Isolation Valve.

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- 5.4.3.5 On NTF Jbox #1, OPEN ROV-132, Core Flow Isolation Valve, by depressing green button.
- 5.4.3.6 On Panel C, ROTATE facility start key to “ENABLE” position. Red light in “START/PYRO” should light up.
- 5.4.3.7 Start the ‘Blowdown’ by pushing the “Start/Pyro Enabled” push-button located on Panel C. [ROV-101A/101B will open and pressure will reach set point. (Green run light should light up)].
- 5.4.3.8 When parameters set by test requestor stabilize, Initiate data collection.
- 5.4.3.9 When the data collection process is completed, adjust the setpoint on PIC 110 to 50 psi.
- 5.4.3.10 Stop the ‘Blowdown’ by pushing the test “Stop” push-button located on Panel C.
- 5.4.3.10 Place the Test Systems Master Control Disable/Enable switch on Panel C in the “Disable” position and remove key.
- 5.4.3.11 On NTF J. Box #1, by depressing button close the NTF core flow isolation valve.
- 5.4.3.12 De-energize the area alarm and warning system by placing the “Bells” switch on Panel C to “Off”.
- 5.4.3.13 Stop the facility computer monitoring facility components.

NOTE

At the discretion of the test engineer, E1 and E2 may be operated individually or simultaneously to achieve the desired test conditions.

5.4.4 EJECTOR #1 and/or EJECTOR #2 operation

- 5.4.4.1 Energize the area alarm and warning system by placing the “Bell” switch on Panel C to “On” and check parking area for pedestrians.
- 5.4.4.2 If using core flow, Remove pyrotechnic key, JB13, located on the south side of the plenum cart.
- 5.4.4.3 Start recording facility data with the facility data acquisition computer.

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- 5.4.4.4 Place NTF isolation valve key into switch. Rotate key to the “ENABLE” location for the ejector and core flow isolation valve switch.
- 5.4.4.5 If using core flow, On NTF J. Box #1, by depressing button OPEN ROV-132, NTF core flow isolation valve. Green light should indicate valve is open.
- 5.4.4.6 If using core flow, On Panel C, using pyrotechnic key, place disable/enable switch to “Enable” position. (Red light in start/pyro should light.)
- 5.6.4.7 Using the Kent-Taylors, Set PCV-531, PCV-532, PCV-521, and/or PCV-522, Ejector Control Valves, to the desired set point position.
- 5.6.4.8 If using ‘core flow’, start the ‘blowdown’ by using the core flow procedure found in section 5.6.3 of this procedure.
- 5.6.4.9 Open isolation valves ROV-511 and ROV-512.
- 5.6.4.10 When parameters set by test requestor stabilize, Initiate data collection.
- 5.6.4.11 When the data collection process is completed, adjust the setpoint on PIC 110 to 50 psi.
- 5.6.4.12 Stop the ‘Blowdown’ by pushing the test “Stop” push-button located on Panel C and following procedure found in section 5.6.3 of this procedure.
- 5.6.4.13 Place the Test Systems Master Control Disable/Enable switch on Panel C in the “Disable” position and remove key.
- 5.6.4.14 On NTF J. Box #1, by depressing button CLOSE ROV-132, NTF core flow isolation valve.
- 5.6.4.15 On NTF J. Box #1, by depressing button, CLOSE ROV-512, NTF-E2 Ejector isolation valve, and ROV-511, TTE/NTF-E1 Ejector isolation valve.

NOTE

Steps 5.6.4.16 through 5.6.4.29 are performed to bleed trapped air in the system.

- 5.6.4.16 CLOSE HOV-109, SAF Tank Isolation Valve.
- 5.6.4.17 CLOSE HOV-110, HOV-109 Bypass Valve.
- 5.6.4.18 OPEN PCV-531, E1 2” Pressure Control Valve.

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- 5.6.4.19 OPEN PCV-521, E1 4" Pressure Control Valve.
- 5.6.4.20 OPEN PCV-522, E2 4" Pressure Control Valve.
- 5.6.4.21 OPEN PCV-532, E2 2" Pressure Control Valve.
- 5.6.4.22 OPEN ROV-511, TTE/NTF-E1 Ejector isolation valve.
- 5.6.4.23 OPEN ROV-512, NTF-E2 Ejector isolation valve.
- 5.6.4.24 CLOSE ROV-512, NTF-E2 Ejector isolation valve.
- 5.6.4.25 CLOSE ROV-511, TTE/NTF-E1 Ejector isolation valve.
- 5.6.4.26 CLOSE PCV-531, E1 2" Pressure Control Valve.
- 5.6.4.27 CLOSE PCV-521, E1 4" Pressure Control Valve.
- 5.6.4.28 CLOSE PCV-532, E2 2" Pressure Control Valve.
- 5.6.4.29 CLOSE PCV-522, E2 4" Pressure Control Valve.
- 5.6.4.30 De-energize the area alarm and warning system by placing the "Bells" switch on Panel C to "Off".
- 5.6.4.31 Stop the facility computer.

5.6.5 SHUTDOWN

5.6.5.1 PREREQUISITES

- 5.6.5.1.1 The need for the test system no longer exists. (i.e., test cancellation, test completion or facility modification/repair).
- 5.6.5.1.2 Test Systems Master Control Disable/Enable switch on Panel C is in the "Disable" position and key is removed.

5.6.5.2 PROCEDURE

The Facility Operator shall –

- 5.6.5.2.1 VERIFY ROV-132, NTF core flow isolation valve closed.

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5.6.5.2.2 PLACE TIC-107, TCV-107A/B Temperature Indicating Controller on Panel D, in manual by pressing the “M” push-button on the controller.

5.6.5.2.3 PLACE PIC-110, PCV-110 Pressure Indicating Controller on Panel D, in manual by pressing the “M” push-button on the controller.

5.6.5.2.4 CLOSE HOV-109, SAF Tank Isolation Valve.

5.6.5.2.5 CLOSE HOV-110, HOV-109 Bypass Valve.

NOTE

Steps 5.6.5.2.6 through 5.6.5.2.10 are performed to bleed trapped air in the system.

5.6.5.2.6 CLOSE HOV-109, SAF Tank Isolation Valve.

5.6.5.2.7 CLOSE HOV-110, HOV-109 Bypass Valve.

5.6.5.2.8 OPEN PCV-531, E1 2”Pressure Control Valve.

5.6.5.2.9 OPEN PCV-521, E1 4”Pressure Control Valve.

5.6.5.2.10 OPEN PCV-522, E2 4”Pressure control Valve.

5.6.5.2.11 OPEN PCV-532, E2 2”Pressure Control Valve.

5.6.5.2.12 OPEN ROV-511, TTE/NTF-E1 Ejector isolation valve.

5.6.5.2.13 OPEN ROV-512, NTF-E2 Ejector isolation valve.

5.6.5.2.14 CLOSE ROV-512, NTF-E2 Ejector isolation valve.

5.6.5.2.15 CLOSE ROV-511, TTE/NTF-E1 Ejector isolation valve.

5.6.5.2.16 CLOSE PCV-531, E1 2”Pressure Control Valve.

5.6.5.2.17 CLOSE PCV-521, E1 4”Pressure Control Valve.

5.6.5.2.18 CLOSE PCV-532, E2 2”Pressure Control Valve.

5.6.5.2.19 CLOSE PCV-522, E2 4”Pressure Control Valve.

5.6.5.2.20 Align valves in accordance with Table H.

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5.6.5.2.21 SHUTDOWN the hydraulic system per Section 5.2 of this procedure.

5.6.5.2.21 SHUTDOWN the service air system per Section 5.3 of this procedure.

5.6.5.2.22 SHUTDOWN the facility electrical system per Section 5.1 of this procedure as needed. The majority of the electrical system remains powered when facility is not in use.

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TABLE G
BARITRON OPERATION

1.0	Start of the day.
1.1	Record value in display for each Baritron in record log.
1.2	If value is equal or greater than 100 milliTorr for B1 (1000 Torr), units need to be rezeroed. B1 and B2 should read about the same value.
1.3	Turn off Alacatel pump located in old dual leg.
1.4	Slowly bleed pressure up to atm.
2.0	End of the day.
2.1	Activate Alacatel pump.
2.2	Verify Baritron transducers are pulling down to vacuum.
2.3	Leave pump on overnight.

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TABLE H
ANNUNCIATOR PANEL LIGHT CHECK

NOTE: INSTRUMENTATION AND CONTROL ITEMS THAT NEED TO BE “JUMPERED” OR UNHOOKED TO OPERATE THE Turbine Test Facility (TTE) AS NTF.

1.0	Verify jumper installation on the following locations:	
	Annunciator	Term.
(1)	Pressure ratio in Manual	G2TB4 9 & 10
(2)	Pressure Differential HI	G2TB4 7 & 8
(3)	Model Speed LO	G2TB4 25 & 26
(4)	DYNO NOT READY	G2TB4 43 & 44
(5)	Pressure Differential HI-HI	G3TB4 13 & 14
(6)	Model Lube Flow LO	G3TB4 21 & 22
(7)	Speed Profile Controller Not Ready	G3TB4 31 & 32
(8)	Gear Box System Problem	G3TB4 41 & 42
(9)	Model Lube Pressure LO	G3TB4 45 & 46
(10)	Model Scavange Control Not Ready	G3TB4 47 & 48
(11)	Air Temperature HI	G2TB4 3 & 4
(12)	Model Speed HI	G3TB4 5 & 6
(13)	Model Speed HI-HIy	G3TB4 9 & 10
2.0	On Annunciator No. 1 Test Systems, PRESS the "Test" push-button.	
3.0	VERIFY all annunciator windows are illuminated.	
4.0	REPLACE any light bulbs that are not illuminated.	
5.0	On Annunciator No. 1 Test Systems, PRESS the "Ack" push-button.	

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TABLE H (con.'t)
ANNUNCIATOR PANEL LIGHT CHECK

6.0	On Annunciator No. 1 Test Systems, PRESS the "Reset" push-button.	
7.0	VERIFY all annunciator windows are illuminated.	
8.0	REPLACE any light bulbs that are not illuminated.	
9.0	On Annunciator No. 2 Drive Systems, PRESS the "Ack" push-button.	
10.0	On Annunciator No. 2 Drive Systems, PRESS the "Reset" push-button.	

(Refer to **Volume B** for further information on annunciators.)

TABLE I
STORAGE FARM TANK CHARGING OPERATION

1.0	To begin Storage Tank Charging, perform the following in the 4777A control room:	
1.1	OPEN the Storage Tank Charging System Safety Valve using the handswitch located on Rack B.	
1.2	OPEN the Storage Tank Charging System Charge Valve using the handswitch located on Rack B.	
2.0	To stop Storage Tank Charging, perform the following:	
2.1	CLOSE the Storage Tank Charging System Charge Valve using the handswitch located on Rack B.	
2.2	CLOSE the Storage Tank Charging System Safety Valve using the handswitch located on Rack B.	

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TABLE J
TCS CONTROLLER AUTOMATIC OPERATION

The Facility Operator shall –

1.0	SET TIC-107, TCV-107A/B Temperature Indicating Controller on Panel D, to the desired temperature (To) required for the current test as follows:
1.1	SELECT Loop 1 on TIC-107 by pressing the " " push-button.
1.2	PLACE Loop 1 of TIC-107 in manual by pressing the "M" push-button on the controller.
1.3	SELECT Loop 2 on TIC-107 by pressing the " " push-button.
1.4	PLACE Loop 2 of TIC-107 in manual by pressing the "M" push-button on the controller.
1.5	SELECT Loop 1 on TIC-107 by pressing the " " push-button.
1.6	ADJUST TIC-107 to the desired temperature setpoint by pressing the "SP" push-button and the setpoint increase (" ") or decrease (" ") push-button simultaneously.
2.0	SET PIC-110, PCV-110 Pressure Indicating Controller, to the desired pressure as follows:
2.1	PLACE PIC-110 in manual by pressing the "M" push-button on the controller.
2.2	ADJUST PIC-110 to desired pressure setpoint by pressing the "SP" push-button and the setpoint increase (" ") or decrease (" ") push-button simultaneously.

Table K
TCS CONTROLLER MANUAL OPERATION

The Facility Operator shall –

1.0	Manually ADJUST valve PCV-110 to the desired position by pressing the "M" push-button and the setpoint increase (" ") or decrease (" ") push-button simultaneously on PIC-110, PCV-110 Pressure Indicating Controller.
2.0	Manually ADJUST valve TCV-107A/B to the desired position by pressing the "M" push-button and the setpoint increase (" ") or decrease (" ") push-button simultaneously on TIC-107, TCV-107A/B Temperature Indicating Controller on Panel D.

(Refer to **Volume D** for further information on TCS controllers.)

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TABLE L

START-UP VALVE LINEUP			
VALVE NUMBER	VALVE NAME	POSITION REQUIRED	INITIALS
ROV 101A/B	CORE AIR SUPPLY ISOLATION	CLOSED (NOTE 1)	
VPV 107A	TEST AIR TEMPERATURE CONTROL VALVE (HOT)	OPEN (NOTE 1)	
VPV 107B	TEST AIR TEMPERATURE CONTROL VALVE (COLD)	CLOSED (NOTE 1)	
VPV 110	PRESSURE CONTROL VALVE – MODEL INLET	CLOSED (NOTE 1)	
VPV 115	MODEL BACKPRESSURE VALVE	CLOSED (NOTE 1)	
ROV 511	EJECTOR 1 ISOLATION VALVE	CLOSED	
ROV 512	EJECTOR 2 ISOLATION VALVE	CLOSED	
VPV 532	2” EJECTOR VALVE	CLOSED	
VPV 522	4” EJECTOR 2 VALVE	CLOSED	
VPV 531	2” EJECTOR 1 VALVE	CLOSED	
VPV 521	4” EJECTOR 1 VALVE	CLOSED	
ROV BLUE	CORE ISOLATION VALVE	CLOSED	
HOV 101	TANK ISOLATION VALVE	OPEN	
HOV 102	TANK ISOLATION VALVE	OPEN	
HOV 110	V-109 BYPASS VALVE	CLOSED	

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Table L (con.'t)

START-UP VALVE LINEUP			
VALVE NUMBER	VALVE NAME	POSITION REQUIRED	INITIALS
HOV 109	SAF TANK ISOLATION VALVE	CLOSED	
HOV 112	HOV 111 BYPASS VALVE	CLOSED	
HOV 111	MIXER ISOLATION VALVE	CLOSED	
HOV 501	EJECTOR 1 ISOLATION VALVE	OPEN	
HOV 502	EJECTOR 2 ISOLATION VALVE	OPEN	
HOV 350	TTE EJECTOR ISOLATION VALVE	CLOSED	
HOV 541	EJECTOR 1 ISOLATION VALVE	OPEN	

NOTE 1: If PCV-110, TCV-107A, TCV-107B or PCV-115 are not in their correct position, the hydraulic system may have to be started per NTE-HY-001, Hydraulic System Operation, to correctly position these valves.

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TABLE M

Missile Grade Air			
Panel Name	Gage Name	Reading Required	Initials
Actuation Panel	Solenoid Isolation Gage (NOTE 1)	150 psig	
Actuation Panel	Pressure Control Valve Gage (NOTE 2)	115 psig	
AFD Safety Valves	AFD Safety Valve- Downstream Reg. Press (NOTE3)	80 psig	

NOTE 1: Operation for ROV 511 and ROV 512, Ejector Isolation Valves.

NOTE 2: Operation for VPV 532, VPV 522, VPV 521, VPV 531.

NOTE 3: Operation for coreflow isolation blue valve.

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TABLE N

FACILITY DATA ACQUISITION COMPUTER OPERATION

The facility data acquisition (DAQ) system consists of three computers and numerous transducers and signal conditioners. The facility operator's computer is located in the TTE control room. It is connected to the other two computers by an Ethernet LAN. The operator's computer has a GPIB connection to a PSI rack and a NI plug-in data acquisition board connected to a signal conditioning chassis.
The second computer is located in the valve room, adjacent to the test chamber. It also has a GPIB connection to a PSI rack and a NI plug-in DAQ board connected to a signal conditioning chassis. During operation, this computer will operate in remote mode, meaning that it will be controlled by the operator's computer from the TTE control room.
The third computer will be for test engineer use and located in the TTE control room. It will receive data from the operator's computer over the LAN, which can be displayed in real-time. This computer will also have an Ethernet connection to the Marshall domain.

1.0	OPERATING INSTRUCTIONS
1.1	Power ON NTF and remote computers, and both SCXI chassis.
1.2	Power ON PSI System equipment if it is to be used.
1.3	LOGIN as data system operator. (Operator consult system administrator if password, dso99, or userid, dso, should change.)
1.4	Double click on NTF data acquisition icon from the desktop to launch the program.
1.5	Access configuration by clicking on 'CONFIGURE' button from main panel.
1.6	Enter/confirm configuration of Facility and Remote DAQ, T/C, and PSI system.
1.7	Enter/confirm information in the headers. Access from menu or headers button. Save this file periodically and at end of the day. (It can then be loaded the following day prior to testing.)
NOTE:	Facility Headers pertains to non-data information associated with testing where the 'NAME' and 'VALUE' are specified for all runs for that test series. Required Headers pertains to non-data information associated with testing where the 'NAME' is specified for all runs for that test series. Normal Headers is any additional information which engineers or operators may want to add.
1.8	Verify that 'Remote Application' is running by illumination of green light on main menu.
1.9	Click on 'Wind off Zero'.
NOTE:	This feature will zero out all necessary active channels. This step is to be performed each time software is started and anytime the facility configuration changes.
1.10	Click on 'Calibrate PSI'.
NOTE:	This feature calibrates the facility PSI rack. It may be necessary to calibrate several times through out the day.

CONTINUES

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TABLE N (con.'t)

FACILITY DATA ACQUISITION COMPUTER OPERATION

1.11	Go to 'test set-up' under set up on the main menu screen.
1.11.1	Verify information.
1.11.2	Per test engineer toggle auto-increment, run number, or rerun number.
1.12	To begin recording data, press 'Press for continuous DAQ'. Data is now continuously measured, displayed, and saved to the facility file
1.13	To stop recording data, press 'Press for continuous DAQ'.
2.0	Shutdown
2.1	To shutdown, click on 'Press to Quit'.
2.2	Log off computer.

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TABLE O Shutdown Valve Lineup

VALVE NUMBER	VALVE NAME	POSITION REQUIRED
ROV 101A/B	CORE AIR SUPPLY ISOLATION	CLOSED (NOTE 1)
VPV 107A	TEST AIR TEMPERATURE CONTROL VALVE (HOT)	OPEN (NOTE 1)
VPV 107B	TEST AIR TEMPERATURE CONTROL VALVE (COLD)	CLOSED (NOTE 1)
VPV 110	PRESSURE CONTROL VALVE – MODEL INLET	CLOSED (NOTE 1)
VPV 115	MODEL BACKPRESSURE VALVE	CLOSED (NOTE 1)
ROV 511	EJECTOR 1 ISOLATION VALVE	CLOSED
ROV 512	EJECTOR 2 ISOLATION VALVE	CLOSED
VPV 532	2” EJECTOR VALVE	CLOSED
VPV 522	4” EJECTOR 2 VALVE	CLOSED
VPV 531	2” EJECTOR 1 VALVE	CLOSED
VPV 521	4” EJECTOR 1 VALVE	CLOSED
ROV BLUE	CORE ISOLATION VALVE	CLOSED
HOV 101	TANK ISOLATION VALVE	OPEN
HOV 102	TANK ISOLATION VALVE	OPEN
HOV 110	V-109 BYPASS VALVE	CLOSED

CONTINUES

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TABLE O

SHUTDOWN VALVE LINEUP			
VALVE NUMBER	VALVE NAME	POSITION REQUIRED	INITIALS
HOV 109	SAF TANK ISOLATION VALVE	CLOSED	
HOV 112	HOV 111 BYPASS VALVE	CLOSED	
HOV 111	MIXER ISOLATION VALVE	CLOSED	
HOV 501	EJECTOR 1 ISOLATION VALVE	OPEN	
HOV 502	EJECTOR 2 ISOLATION VALVE	OPEN	
HOV 350	TTE EJECTOR ISOLATION VALVE	CLOSED	
HOV 541	EJECTOR 1 ISOLATION VALVE	OPEN	

NOTE 1: If PCV-110, TCV-107A, TCV-107B or PCV-115 are not in their correct position, the hydraulic system may have to be started per NTE-HY-001, Hydraulic System Operation section 5.2 to correctly position these valves.

6.0 NOTES

Refer to appropriate or specific operating procedure.

7.0 SAFETY PRECAUTIONS AND WARNING NOTES

7.1 **EMERGENCY** telephone numbers are as follows:

Ambulance	911
Medical Center	4-2390
Fire	911
Security	4-4357
Utilities	4-3919
Communication Repair	4-1771

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- 7.2 Exercise caution in the vicinity of electrical equipment, high temperature systems and high noise areas.
- 7.3 Any conflicts encountered during the performance of this procedure should be resolved prior to completion of the procedure.
- 7.4 Steps in this procedure are to be performed in the order listed unless deviation is permitted by the facility engineer.
- 7.5 ALL prerequisites shall be completed prior to commencing a section of a procedure.
- 7.6 When an unsafe condition exists, the Facility Engineer or his designee will take immediate action to prevent injury to personnel, damage to facilities and/or equipment.
- 7.7 The Facility Engineer or his designee will clear and secure the test area when it is deemed that such precautions are necessary.
- 7.8 Only personnel designated by the Facility Engineer will be allowed in the area of facility activation. Authorized personnel in the test and test control area will immediately report any anomalies, unauthorized entry or unauthorized activities to the Facility Engineer.
- 7.9 If personnel must enter the area under hazardous conditions, personnel authorized to enter the area shall be specified by the Facility Engineer or his designee.
- 7.10 Personal Protective Equipment (PPE) is required for various aspects of NTF operations. Steel-toed shoes are always required for lifting and handling operations around the NTF. Hardhats, ear plugs, gloves, safety glasses, etc. are available at the PPE station in the facility.

8.0 APPENDICES, DATA, REPORTS, AND FORMS

- 8.1 Test Plan (or Pre-test report): A Test Plan shall be generated as a memorandum for each Group test activity and will, as a minimum, include the following:
 - 8.1.1 Introduction (background, scope)
 - 8.1.2 Test Objective(s)
 - 8.1.3 Facility Description
 - 8.1.4 Test Article Description
 - 8.1.5 Measurement and Instrument Requirements
 - 8.1.6 Test Matrix
 - 8.1.7 Online Data Reduction Requirements
 - 8.1.8 Schedule(s)
 - 8.1.9 Expected Results

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8.2 Post-test report: Post-test reports shall be generated as a memorandum for each Group test activity and will, as a minimum, include the following:

- 8.2.1 Introduction (background, scope)
- 8.2.2 Test Objective(s)
- 8.2.3 Pre-test Report Changes
- 8.2.4 Facility Description
- 8.2.5 Test Article Description
- 8.2.6 Measurement and Instrument
- 8.2.7 Run Log (reference copy of facility or completed test matrix)
- 8.2.8 Results
- 8.2.9 References
- 8.2.10 Appendix
- 8.2.11 Measured Data hard copy or reference to location of controlled electronic file(s).

9.0 RECORDS

- 9.1 Run Logs: Run logs are kept to maintain historical information on the use of TD70 Facilities and to assist in the analysis of data after the tests have been completed. Each facility's operation Run Log shall be maintained and retained by the assigned Facility Engineer for a period of 10 (ten) years.
- 9.2 Physical Control of Task Agreement Records: During the period of performance of a Task Agreement, the affected personnel performing the work shall be responsible for the collection, storage, and safekeeping of the records involved with the tasks. At the completion of the task agreement and at various times during the period of performance as appropriate, the affected personnel shall document in the form of memoranda to the customer, all essential records concerning the task. These memoranda shall become the sole records for the tasks and shall be maintained by the organization Secretaries in the standard organization memoranda files. All other adjunct records and data not deemed necessary for inclusion in the memoranda to the customer, if not required by other sections of this OWI or by MSPs or CWIs (e.g., test equipment calibration records, etc.), shall be considered historical data for the affected personnel and outside of the scope of this OI.

10.0 TOOLS, EQUIPMENT, AND MATERIALS

What ever is needed or required per the testing procedure. For each individual procedure see section 5.

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11.0 PERSONNEL TRAINING AND CERTIFICATION

Personnel who operate the NTF must undergo training and certification by authorized NTF personnel. This training is performed at the discretion of the NTF Facility Engineer along with the TD74 Group Leader and as a minimum will consist of the following:

- a. Read and understand all NTF and TD74 applicable Documentation as stated in TD74-001.
- b. 3 months of on-the-job training supervised by the NTF Facility Engineer and /or the certified NTF Facility Technician.

Personnel who complete this training will not be deemed “certified” until the NTF Facility Engineer and the TD74 Group Leader approve them.

In addition to the operator training, test area personnel may be required to complete the requirements for operator certification for crane, forklift, confined space, respirator, etc. This necessity will be determined on an “as needed” basis for the specified test facility and is governed by the guidelines in MPR 8715.1.

12.0 FLOW DIAGRAM

NONE